

Abstract

This invention takes advantage of the characteristics that the effective charge numbers of different metals have different values and even with different signs, and alloys are prepared with the metals of different signs of effective charge numbers. The effective charge numbers of the alloys are the summation of the mole fraction of each constituent metal times its respective effective charge number. Based on the knowledge of the calculated effective charge number, alloys are prepared with proper selection of constituent metals and proper ratios. When the alloy is under the influence of an electric field, the atoms, with the tendency to move in the same direction of the electron flow, interact with the atoms, with the tendency to move in the opposite. The alloys are thus electromigration effect-free or electromigration effect-insignificant.